

REMARKS

This Amendment responds to the Office Action mailed December 16, 2004 in the above-identified application. Based on the foregoing amendments and the following comments, reconsideration and allowance of the application are respectfully requested.

Claims 1-24 were previously pending in the application. Claims 7-17 and 19-24 have been withdrawn from consideration. Claims 1, 2 and 18 have been amended, and new claims 25 and 26 have been added. Accordingly, claims 1-6, 18, 25 and 26 are currently under consideration, with claims 1 and 18 being independent claims. No new matter has been added.

The Examiner has objected to the drawings because reference characters 70, 72, 74, 76 and 78 in Fig. 7 are not mentioned in the description and because of handwriting in various drawings. Enclosed herewith are formal drawings which overcome the objections. Reference characters 70, 72, 74, 76 and 78 have been eliminated from Fig. 7. Approval of the formal drawings is respectfully requested.

The Examiner has rejected claims 1-6 and 18 under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement in that the application does not teach “a trellis instruction that specifies locations of trellis state metrics.” Applicant must respectfully disagree. The application clearly discloses that the trellis instruction specifies register locations of trellis state metrics. It is conventional practice that computer instructions specify register locations of operands. Nonetheless, in order to advance prosecution of the application, claims 1 and 18 have been amended to delete “locations”. Accordingly, withdrawal of the rejection is respectfully requested.

The Examiner has rejected claims 1-6 and 18 under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. The structural cooperative relationship asserted to be omitted is the relationship between the digital signal processor and a method for calculating metrics of a trellis function. Claim 1 has been amended to specify that the adding, subtracting, comparing and selecting operations of the trellis instruction are executed by the digital signal processor in a single clock cycle of the digital

signal processor. Claim 18 has been amended to specify that the adders, the comparator and the data selector of the accelerator are configured to execute the adding, subtracting, comparing and selecting operations of the trellis instruction in a single clock cycle of the processor.

Accordingly, the relationships of elements are clarified in the amended claims.

The Examiner asserts on page 6 of the Office Action that the computation block comprises a data structure with an accelerator function which can be implemented in software as a program for carrying out an Add/Compare/Select function. Applicant respectfully disagrees. The computation block recited in claim 18 is a hardware element which includes an accelerator having hardware elements to execute the trellis instruction. Accordingly, the computation block is not a data structure.

The Examiner has objected to the language “corresponding first and second values” in claims 1 and 18. The term “corresponding” has been deleted from claims 1, 2 and 18. Accordingly, withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

The Examiner has further rejected claims 1-6 and 18 under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between elements. The Examiner asserts that the omitted element is a relationship between the state machine and any useful device or process. Claim 1 has been amended to recite a method for processing signal values and to specify that the trellis state metrics are based on the signal values. Claim 18 has been amended to recite a processor for processing signal values and to specify that the trellis state metrics are based on the signal values. Accordingly, amended claims 1 and 18 are directed to a method and processor, respectively, for processing signal values. Accordingly, the claimed method and processor have utility, and withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

The Examiner has rejected claims 1-6 under 35 U.S.C. §101 because the claimed invention lacks patentable utility. The Examiner asserts that claim 1 is directed to calculating mathematical quantities and has no utility. As noted above, claims 1 and 18 have been amended to recite processing of signal values. Accordingly, the amended claims have utility, and withdrawal of the rejection under 35 U.S.C. §101 is respectfully requested.

The Examiner has rejected claims 1 and 18 under 35 U.S.C. §102(b) as anticipated by Amon et al. (US 5,742,621). Claims 2-6 are rejected under 35 U.S.C. §103(a) as unpatentable over Amon in view of Benedetto et al. (article entitled "Soft-Output Decoding Algorithms in Iterative Decoding of Turbo Codes"). The rejections are respectfully traversed.

The Amon patent discloses a parallel data structure and a dedicated Viterbi shift-left instruction which minimize the number of clock cycles required for decoding a convolutionally encoded signal in a data processing system in software. The data structure and the Viterbi shift-left instruction reduce the number of clock cycles required for performing an add-compare-select butterfly operation (Abstract). Fig. 4 of Amon illustrates assembly code for implementing the ACS butterfly in a digital signal processor in 14 clock cycles (col. 9, lines 24-36). Fig. 5 of Amon illustrates assembly code for implementing the ACS butterfly in a digital signal processor in 10 clock cycles (col. 9, lines 37-49). As shown in Figs. 4 and 5 of Amon, The ACS loop involves multiple instructions.

In distinct contrast to Amon, amended claim 1 is directed to a method for processing signal values, wherein a single trellis instruction, including adding, subtracting, comparing and selecting operations, is executed by a digital signal processor in a single clock cycle of the digital signal processor. Amon contains no disclosure or suggestion of a trellis instruction that can be executed in a single clock cycle as claimed. Accordingly, amended claim 1 is clearly and patentably distinguished over Amon.

Claims 2-6 depend from claim 1 and are patentable over Amon, taken individually or in combination with Benedetto, for at least the reasons discussed above in connection with claim 1. Benedetto does not provide the teachings that are lacking in Amon.

Amended claim 18 is similarly distinguished over Amon. In particular, Amon does not disclose or suggest a processor wherein the adders, the comparator and the data selector of an accelerator are configured to execute the adding, subtracting, comparing and selecting operations of a trellis instruction in a single clock cycle of the processor. For these reasons and for the reasons discussed above in connection with claim 1, amended claim 18 is clearly and patentably distinguished over Amon.

New claims 25 and 26 depend from claim 18 and are patentable over Amon, taken individually or in combination with Benedetto, for at least the reasons discussed above in connection with claims 1 and 18.

In view of the above amendment, Applicant believes the application is in condition for allowance.

A check in the amount of \$100.00 is enclosed to cover the additional claims fee. If the fee is insufficient, the balance may be charged to our Deposit Account No. 23/2825, under Order No. A0312.70410US00 from which the undersigned is authorized to draw.

Dated: March 15, 2005

Respectfully submitted,

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Attachment

AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings include changes to Fig. 7, in which reference characters 70, 72, 74, 76 and 78 have been eliminated. In addition, the drawings no longer contain handwriting.

Attachment: Replacement sheets 1-17 (Figs. 1-18)